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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/955,368	09/18/2001	Harish Viswanathan	16	8345

7590 01/10/2005

Docket Administrator (Room 3J-219)
Lucent Technologies Inc.
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Holmdel, NJ 07733-3030

EXAMINER	
MEEK, JACOB M	

ART UNIT	PAPER NUMBER
2637	

DATE MAILED: 01/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/955,368	VISWANATHAN, HARISH	
	Examiner	Art Unit	
	Jacob Meek	2637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 September 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 - 22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 - 22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *2/12/2002* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *9/01*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings were received on 2/12/2002. These drawings are missing sheet 2 of 4. Resubmission of drawings is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1 - 3, 7 – 12, 14 – 20, and 22 are rejected under 35 U.S.C. 102(e) as being anticipated by Garmonov et al (US Patent 6,510,173).

With regard to claim 1, Garmonov teaches a method for use in a system to transmit four transmit sequences (see figure 4, h where this block is interpreted as equivalent and column and column 5, lines 7 – 17) over at least four antennas (see Figure 4, A1 – A4 where A1 – A4 are interpreted as antenna elements and column 5, lines 29 – 36) compromising the step of space – time coding at least two pairs of symbols substreams (see Figure 4, e and column 5, lines 4 – 6 where this is interpreted as a first substep in the process) to form a respective pair of transmit sequence chains (see Figure 4, g and column 5, lines 7 – 17 where this substep is interpreted as being equivalent) where the space-time coding is such that at least on the formed pairs is a function of a respective pair (see Figure 4, c, d, and g where b_1 and C_{11}, C_{12},

C_{13}, C_{14}, form pairs b_1 C_{11}, b_1 C_{12}, b_1 C_{13}, b_1 C_{14}, which are unique from other pairs formed) and not a function of other pairs (see column 5, line 18 – 20).

With regard to claim 2, Garmonov teaches that each transmit sequence has a duration of four symbol periods (see Figure 4, e, f, g, h and column 5, lines 4- 11 where this is interpreted as equivalent), each transmit sequence of a particular transmit sequence chain is a function of a symbol of one of the symbol streams (see Figure 4, h where b_1 C_{11} in row 1 is the symbol) and complex conjugate of symbols make up remainder of transmit sequence (see Figure 4, where the other symbols in row one are interpreted as complex conjugates) and portions of the four transmit sequence chains are representable by a where each row of a matrix represents one transmit sequence of a different one of the transmit sequence chains (see Figure 4, g and h; column 5, lines 12 – 28) and each column represents a symbol period (see column 5, lines 7 – 11 where this is interpreted as equivalent).

With regard to claim 3, Garmonov teaches his matrix is orthogonal (see column 5, line 12 – 17).

With regard to claim 7, Garmonov teaches the transmission of at least one of the transmit sequence chains on one the respective antennas (see Figure 6, 28, 29, 31-, 32- and column 5, lines 29 – 36).

With regard to claim 8, Garmonov teaches the spreading of symbols of transmit sequence chains using a spreading code (see Figure 6, 29 and column 5, lines 29 – 36).

With regard to claim 9, Garomonov teaches the channel coding of a least 4 data streams, and mapping each of the channel coded data streams to produce symbol sub streams (see column 5, lines 12 – 28).

With regard to claims 10 – 12, and 14, Garmonov discloses an apparatus utilizing the method of claims 1-3, and 8, respectively, as claimed above and therefore it would have been obvious considering the aforementioned rejection for the method claims 1-3, and 8.

With regard to claim 15, Garmonov discloses a transmitter with an input (see Figure 6, Input), at least one channel encoder (see Figure 6, 23 where this is interpreted as channel encoder) between input and space-time encoder (see Figure 6, 29) the channel encoder to channel code a data substream (see Figure 4, c where this is interpreted as providing channel coded functionality).

With regard to claim 16, Garmonov discloses a mapper (see Figure 6, 24, 25) between the channel encoder and space time encoder (see Figure 6, 28), the mapper adapted to into symbol space to produce a symbol substream (see figure 4, e, f, g).

With regard to claim 17, Garmonov discloses his transmitter system is useful for CDMA, which is known to utilize base stations.

With regard to claim 18, Garmonov discloses his transmitter system is useful for CDMA, which is known to utilize base stations.

With regard to claim 19, Garmonov discloses a plurality of radio frequency units (see Figure 6, 31-1 to 31 – N modulator where modulator is interpreted as radio frequency unit) having an coupled to output of space time encoder (see Figure 6, 22-1 to 22-M) each radio frequency unit being adapted to convert baseband to RF (see column 11, lines 13 – 17).

With regard to claim 20, Garmonov discloses a receiver with at least one antenna (see Figure 8, 40) and a matrix multiplier for multiplying received symbol streams having at least two pairs of consecutive rows (see figure 5A, g and column 5, lines 37 – 61) where this is interpreted as providing equivalent functionality).

With regard to claim 22, Garmonov discloses his invention is tested with fading (see column 19, lines 44 – 58).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 4 – 6, 13, and 21 are rejected under 35 U.S.C. 102(e) as anticipated by , or, in the alternative, under 35 U.S.C. 103(a) as obvious over Garmonov.

With regard to claim 4, Garmonov discloses a matrix as structured in reference (6) (see column 16, line 60). Garmonov discloses that there are alternative forms of matrix order (see column 16, lines 8 – 42). Therefore it would have been obvious to one of ordinary skill of the art at the time of invention to utilize alternative orthogonality schemes based on Garmonov's disclosure that a variety of structures could be utilized.

With regard to claim 5, Garmonov discloses a matrix as structured in reference (6) (see column 16, line 60). Garmonov discloses that there are alternative forms of matrix order (see column 16, lines 25 – 42). Therefore it would have been obvious to one of ordinary skill of the art at the time of invention to utilize alternative orthogonality schemes based on Garmonov's disclosure that a variety of structures could be utilized.

With regard to claim 6, Garmonov teaches coding a first pair of symbol substreams (see reference (44) column 16, line 20 where b_1 and b_2 are interpreted as first symbol pair, see Figure 4, c, d, and g; where b_1 and C_{11}, C_{12}, C_{13}, C_{14}, form pairs b_1 C_{11}, b_1 C_{12}, b_1 C_{13}, b_1 C_{14}, b_2 and C_{21}, C_{22}, C_{23}, C_{24}, form pairs b_2 C_{21}, b_2 C_{22}, b_2 C_{23}, b_2 C_{24} which are unique from other pairs

formed and is interpreted as equivalent functionality) to form a first transmit stream that is not a function of second symbol pair, and coding a second pair of symbol substreams to form a second transmit stream that is not a function of first symbol pair (see reference (44) column 16, line 20 where b_3 and b_4 are interpreted as first symbol pair, see Figure 4, c, d, and g; where b_3 and C_{31}, C_{32}, C_{33}, C_{34}, form pairs b_3 C_{31}, b_3 C_{32}, b_3 C_{33}, b_3 C_{34}, b_4 and C_{41}, C_{42}, C_{43}, C_{44}, form pairs b_4 C_{41}, b_4 C_{42}, b_4 C_{43}, b_4 C_{44} which are unique from other pairs formed and is interpreted as equivalent functionality). Garmonov discloses that there are alternative forms of symbol order (see column 16, lines 8 – 42). Therefore it would have been obvious to one of ordinary skill of the art at the time of invention to utilize alternative symbol orders based on Garmonov's disclosure that a variety of structures could be utilized.

With regard to claim 13, Garmonov discloses an apparatus utilizing the method of claims 4, and 5, as claimed above and therefore it would have been obvious considering the aforementioned rejection for the method claims 4, and 5.

With regard to claim 21, Garmonov discloses the receive matrix is identical to transmit matrix (see column 18, lines 2 – 5) and therefore is analyzed as claims 4 and 5 above.

Other Cited Prior Art

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Raleigh et al (US Patent 6,452,981), Kuchi et al (US Patents 6,542,556 and 6,748,024), Dabak et al (US Patent 6,594,473) and Vook et al (US Patent 6,834,043) disclose STTD techniques in the area of invention.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jacob Meek whose telephone number is (571)272-3013. The examiner can normally be reached on 8:00 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on (571)272-2988. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JMM

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SUPERVISORY PATENT EXAMINER